

Claims:

1. A process for separating 2-butanol from an industrial mixture which comprises 2-butanol, tert-butanol, and water wherein the proportion by mass of water is greater than the
5 limit concentration of the distillation boundary line connecting an azeotrope of tert-butanol and water; and an azeotrope of 2-butanol and water, comprising

separating water from the industrial mixture with a membrane to obtain a retentate which comprises a proportion by mass of water, in terms of the 2-butanol, tert-butanol and water in the retentate, is less than the limit concentration of the distillation boundary line
10 connecting connecting an azeotrope of tert-butanol and water; and an azeotrope of 2-butanol and water; and the

separating the retentate by distillation into a stream comprising 2-butanol and a stream comprising tert-butanol and water.

15 2. The process as claimed in claim 1, wherein the separating the water comprises pervaporation.

3. The process as claimed in claim 1, wherein the separating the water comprises vapor permeation.

20 4. The process as claimed in claim 1, wherein the separating the water comprises pervaporation and vapor permeation.

5. The process as claimed in claim 1, which further comprises removing water from the
25 industrial mixture by distillation before separating water with the membrane.

6. The process as claimed in claim 1, wherein the separating water from the industrial mixture with the membrane is conducted at a temperature from 60 to 140 °C.

7. The process as claimed in claim 1, wherein the membrane is an inorganic membrane.

5

8. The process as claimed in claim 7, wherein the separating water from the industrial mixture with the inorganic membrane is conducted at a temperature from 20 to 200 °C

9. The process as claimed in claim 1, wherein the membrane is a polymer membrane.

10

10. The process as claimed in claim 9, wherein the separating water from the industrial mixture with the polymer membrane is conducted at a temperature from 20 to 150 °C

11. The process as claimed in claim 1, wherein the membrane comprises a combination of one of an inorganic membrane or and inorganic support material; and one of a polymer membrane or applied polymer separation layer.

15

12. The process as claimed in claim 1, wherein the retentate has a water content of less than 10% by mass, based on the 2-butanol, tert-butanol and water in the retentate.

20

13. The process as claimed in claim 1, wherein the stream comprising 2 contains less than 1% by mass of tert-butanol.

14. The process as claimed in claim 1, wherein the proportion of water in the retentate is less than 11% by mass when the concentration of 2-butanol is from 0.0001 to 6% by mass.

25

15. The process as claimed in claim 14, wherein the proportion of water in the retentate is less than 10% by mass.

16. The process as claimed in claim 14, wherein the proportion of water in the industrial
5 mixture is less than 9.5% by mass.

17. The process as claimed in claim 1, wherein the proportion of water in the industrial
mixture is less than 15 % by mass when the concentration of 2-butanol is from 6.01 to 15% by
mass.

10

18. The process as claimed in claim 17, wherein the proportion of water in the industrial
mixture is less than 14 % by mass.

19. The process as claimed in claim 17, wherein the proportion of water in the industrial
15 mixture is less than 13 % by mass.

20. The process as claimed in claim 1, wherein the industrial mixture is a side stream
discharged from a distillation column in gaseous or liquid form, wherein the side stream is fed
to the membrane whereby water is discharged through the membrane as permeate and the
20 retentate is fed back into the column at the point where at the same or different points in the
distillation column where the industrial mixture side stream is discharged, and the stream
comprising 2-butanol is separated off at a bottom portion of the column.